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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,825	04/01/2004	Masashi Fujishima	327339M098	5321

7590 01/14/2005

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EXAMINER	
LEE, PETER	

ART UNIT	PAPER NUMBER
2852	

DATE MAILED: 01/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/814,825	FUJISHIMA ET AL.	
	Examiner	Art Unit	
	Peter Lee	2852	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-7 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-7 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 01 April 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4/1/2004.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Developing Apparatus and Method for Regulating an AC Bias Frequency to the Developing Roller".

Claim Objections

1. Claims 1 and 2 are objected to because of the following informalities:

Claims 1 and 2 are objected for not clarifying if the claims pertain to an apparatus or a method. As it is written, the limitations of the method are being explained in the preamble of claim 1 and the limitations of the apparatus are explained afterwards in the second half of claim 1 and then in claim 2. A problem arises in that the developing roller being claimed in the method of the preamble may not be given weight for the apparatus being claimed after it, resulting in improper antecedent basis for the developing roller of the apparatus.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (US 2002/0018672) in view of Suzuki (US pn 4334772)

Ozawa teaches an image formation apparatus (fig. 6) that develops an electrostatic latent image on photoreceptors (fig. 6 parts 3A-3D) by means of a thin toner layer (page 3 paragraph [0051]), which comprises forming on surface of a developer roller (fig. 1 part 2) via toner of a magnetic roller (fig. 1 part 1) and magnetic brush of carrier articles (fig. 1 part 10), so as to form an image, and a gap between the developer roller and a drum of the photoreceptor is set in a range of 200 μm to 300μm (page 4 paragraph [0072]) (ie. range of 150 to 300 μm and more specifically in the range of 150 to 280μm).

Ozawa does not specifically teach the developer roller being made of aluminum and having an aluminum oxide film of at least 5 μm, or more specifically 10 to 20 μm, in thickness formed on the surface.

Suzuki teaches a developing roller (fig. 2 part 22) having an aluminum sleeve (fig. 2 part 25) (ie. developer roller made of aluminum) with an insulating layer made of aluminum oxide being 5 to 50μm thick (col. 4 lines 34-40) (ie. within the range of at least 5μm thick and between 10 to 20μm) in case of contact with the photosensitive drum.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the developing roller taught in Ozawa to be aluminum and have a layer of aluminum oxide as taught by Suzuki. One of ordinary skill in the art would have been motivated to do so because the aluminum oxide provides an insulating layer to obviate the deterioration of charge in the event the developing roller were to contact the charged photosensitive drum (col. 4 lines 30-34).

3. Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa in view of Suzuki as applied to claims1 and 2 above, and further in view of Iguchi et al. (US pn 5999782).

Ozawa and Suzuki combine to teach all of the limitations as laid out above for the image forming apparatus and method. In addition, Ozawa teaches the developer roller to have both an AC and a DC bias source connected to it to provide a superimposed bias (fig. 1 part 7; note: table/fig. 8 and page 4 paragraph 0062]) (ie. applying a DC voltage superposed with an AC voltage). Ozawa also teaches that the electrostatic fields generated by the latent image on the photoreceptor attract toner from the carrier to develop the latent image page 3 paragraph 0056]) (ie. charged toner flies onto the electrostatic latent image for development).

They do not teach regulating the frequency of the AC voltage to be higher during non-development states, in the range of 4-8 kHz and more specifically 5-8 kHz, than during development states, in the range of 1-4 kHz and even more specifically 1-3 kHz.

Iguchi teaches the practice of applying an AC voltage superimposed on a DC voltage to a developer carrier (fig. 1 part 11; note col. 3 lines 30-34). He also teaches having two distinct periods, T1 and T2, that match up to a first action period (ie. developing state) and a second rest period (ie. non development state) respectively (col. 1 lines 60-67). The frequency of the AC voltage applied to the developer carrier is taught to be greater during the second period (see col. 6 table 2), with a frequency during the first action period (ie. development stage) being 3kHz (ie. between 1-4 kHz, more specifically 1-3 kHz) and the frequency during the second rest period (ie. non-development state) being between 0-12 kHz (ie. between 4-8 kHz, more specifically 5-8 kHz) in order to optimize image characteristics.

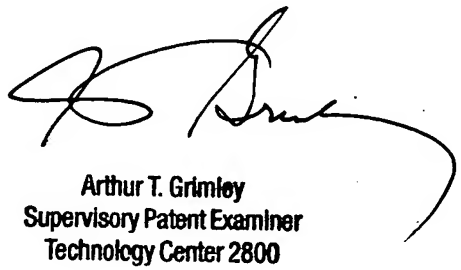
It would have been obvious to a person of ordinary skill at the time the invention was made to modify the method of development taught by Ozawa in view of Suzuki to increase the frequency of an AC component biasing the developer carrier during non-developing states as taught in Iguchi. This modification is seen to be possible because the developer roller taught in Ozawa is seen to already have the AC voltage superimposed on the DC bias (fig. 1 part 7). One of ordinary skill would have been motivated to employ the method of alternating an AC bias frequency in order to obtain images with superior texture and minimal density irregularity (col. 6 lines 16-24).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Lee whose telephone number is 571-272-2846. The examiner can normally be reached on mon-fri 9:00 am-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Arthur Grimley can be reached on 571-272-2136. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PL 1/11/05



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